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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/735,097	12/11/2000	John J. Weisgerber	GSIL0148 PUS	5342

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EXAMINER

KIBLER, VIRGINIA M

ART UNIT	PAPER NUMBER
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2623

DATE MAILED: 08/15/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/735,097

Applicant(s)

WEISGERBER ET AL.

Examiner

Virginia M Kibler

Art Unit

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 December 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☒ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4,5 6) ☐ Other:

Art Unit: 2623

DETAILED ACTION

Oath/Declaration

1. Applicant has not given a post office address anywhere in the application papers as required by 37 CFR 1.33(a), which was in effect at the time of filing of the oath or declaration. A statement over applicant's signature providing a complete post office address is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Regarding claims 1 and 11, the phrases "other interconnects," "other attributes," and "other material" render the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed, thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 2, 11, and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Mengel (*Automated Inspection of Solder Joints on PC Boards by Supplementary Processing of 3D and grey-level Images*).

Art Unit: 2623

Regarding claim 1, Mengel discloses a method for inspecting electronic components mounted on a PCB with a mounting substance, each of the components including leads or endcaps (Abstract, lines 1-5). Mengel further discloses imaging the components and the mounting substance on the PCB to obtain 3D and 2D data associated with the components and material surrounding the components (Page 787, col. 2, para. 1), and processing the 3D and 2D data in combination to find the locations of the components based on the identified leads or endcaps as differentiated from the mounting substance and circuit board on which the components are placed (Page 787, col. 2, para. 3-4)

Regarding claim 2, Mengel discloses the mounting substance as solder paste (Abstract, lines 6-9).

Regarding claims 11 and 12, the arguments analogous to those presented above for claims 1 and 2 are applicable to claims 11 and 12, respectively.

6. Claims 6 and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Roy et al. (5,956,134).

Regarding claims 6 and 16, Roy et al. ("Roy") discloses a method for inspecting electronic components mounted on a PCB with a mounting substance, each of the components including leads (Col. 2, lines 59-64) comprising imaging the components and the mounting substance on the PCB to obtain 3D and 2D data associated with the components and material surrounding the components, and processing the 3D and 2D data in combination to find the locations of the components based on identified leads as differentiated from the mounting substance and circuit board on which the components are placed (Col. 3, lines 10-37). Roy

Art Unit: 2623

further discloses the leads have feet and the step of processing includes the step of calculating the average height of the feet (Col. 6, lines 5-13).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 3, 4, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mengel (*Automated Inspection of Solder Joints on PC Boards by Supplementary Processing of 3D and grey-level Images*) as applied to claims 1 and 11 above, and further in view of Prosky (4,159,648).

Regarding claims 3 and 13, Mengel does not appear to recognize the mounting substance as an adhesive. However, Prosky teaches that it is known to use an adhesive as a mounting substance (Col. 4, lines 47-49). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the solder paste disclosed by Mengel to include an adhesive, as taught by Prosky, as an alternative mounting substance.

Regarding claims 4 and 14, the arguments analogous to those presented above for claim 3 are applicable to claims 4 and 14. Note, Prosky discloses a glue (Col. 4, lines 47-49).

9. Claims 5, 8, 9, 15, 18, 19, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mengel (*Automated Inspection of Solder Joints on PC Boards by Supplementary Processing of 3D and grey-level Images*) as applied to claims 1 and 11 above, and further in view of Montillo et al. (6,526,165).

Art Unit: 2623

Regarding claims 5 and 15, Mengel does not appear to recognize calculating the centroids of the feet of the leads. However, Montillo et al. ("Montillo") teaches that it is known to calculate the centroids of the feet (Col. 6, lines 3-40). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the inspection of solder joints disclosed by Mengel to include calculating the centroids of the feet as taught by Montillo as an alternative way to accurately inspect the placement of the object by properly registering the object with the pads on a PCB (Col. 1, lines 31-37).

Regarding claims 8 and 18, Mengel does not appear to recognize pruning. However, Montillo teaches that it is known to mask the board to segment the foot from the background, thereby pruning (Col. 11, lines 54-56). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the evaluation of the component detection to include pruning as taught by Montillo in order to isolate the foot to determine its parameters (Col. 11, lines 31-46).

Regarding claims 9 and 19, the arguments analogous to those presented above for claim 8 are applicable to claims 9 and 19. Note, Montillo discloses pruning the foot of the leads.

Regarding claim 21, the arguments analogous to those presented above for claim 1 are applicable to claim 21. Mengel does not appear to expressly state isolating the endcaps from their bodies. However, Montillo teaches that it is known to process the 2D data in order isolate the leads (Col. 11, lines 31-46). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the processing of the 2D data disclosed by Mengel to include isolating the endcaps, as taught by Montillo, in order to determine its parameters.

Art Unit: 2623

10. Claims 7 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mengel (*Automated Inspection of Solder Joints on PC Boards by Supplementary Processing of 3D and grey-level Images*) as applied to claims 1 and 11 above, and further in view of Kent et al. (6,047,084).

Regarding claims 7 and 17, Mengel does not appear to recognize calculating the border violation percentage of the mounting substance. However, Kent et al. ("Kent") teaches that it is known to calculate the border violation percentage of the mounting substance (Col. 12, lines 4-25). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the inspection of the mounting substance disclosed by Mengel to include calculating the border violation percentage of the mounting substance as taught by Kent in order to ensure physical and electrical connectivity of the solder to the pad (Col. 12, lines 23-26).

11. Claims 10 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mengel (*Automated Inspection of Solder Joints on PC Boards by Supplementary Processing of 3D and grey-level Images*) as applied to claims 1 and 11 above, and further in view of Paulsen et al. (6,522,777).

Regarding claims 10 and 20, Mengel does not appear to recognize including using upper and lower thresholds to find the locations. However, Paulsen et al. ("Paulsen") teaches that it is known to use upper and lower thresholds to find the locations (Col. 6, lines 39-47). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the comparison disclosed by Mengel (Page 788, col. 2) to include using an upper and

Art Unit: 2623

lower thresholds as taught by Paulsen in order ensure coplanarity within a predetermined tolerance.

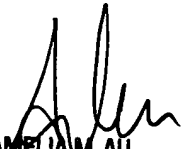
Contact Information

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Virginia M Kibler whose telephone number is (703) 306-4072. The examiner can normally be reached on Mon.-Thurs. 8:00 - 5:30 and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703) 308-6604. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.

VK
August 10, 2003


AMELIA M. AU
SUPERVISORY PATENT EXAMINER
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